REMARKS

Claims 1-8, 16-19 and 30 are pending in the application. Claims 1, 3-5, 7 and 16 have been amended in the present response. Claims 63-74 have been added. In the Office Action dated June 4, 2007, the Examiner rejected claims 1-3, 5-8, 16-19, and 30 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,424,763 to Villeneuve et al. ("Villeneuve"). The Examiner objected to claim 4 as being dependent upon a rejected base claim and indicated that it would be allowable of rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Discussion of the Disclosed Embodiments

The disclosed embodiments of the invention will now be discussed in comparison to the prior art. Of course, the discussion of the disclosed embodiments, and the discussion of the differences between the disclosed embodiments and the prior art subject matter, do not define the scope or interpretation of any of the claims. Instead, such discussed differences merely help the Examiner appreciate important claim distinctions discussed thereafter.

Applicant discloses various embodiments of a binary super grating (BSG) formed by an array of individual pixels, each of which includes a discrete structure, such as an actuated beam or electrode that is independently controllable to alter the index of refraction in a discrete area proximate a waveguide. The BSG is disposed between two waveguides and is controlled to alter the coupling of light between the waveguides. The BSG is positioned adjacent the waveguide and interacts with the evanescent wave. The pixels of the BSG are controlled such that total internal reflection within the waveguide is frustrated for selected wavelengths, resulting in coupling of light from the first to the second waveguide. In some applications, the BSG is controlled such that light is coupled to the second waveguide such that its direction of travel is reversed.

Discussion of the Cited Reference

Villeneuve discloses a tunable electromagnetic field frequency filter in which a bus (302) and receiver (304) are positioned on either side of a resonator system, including three gratings (112, 114, 116) having two resonators (108, 110) disposed between the gratings. Col. 4,

lns. 38-50. An electrode is positioned over each grating and each resonator and the voltage is adjusted to control the resonant frequency of the resonator system and thereby control the coupling of light between the bus and receiver. Col. 3, lns. 48-57.

As is apparent from Figure 3 (reproduced to the right), the electrodes represented by the cross hatched regions extend over the entire grating or resonator. Villeneuve teaches only six signals applies to the electrodes, only three of which S_{G1}, S_{G2}, and S_{G3} are applied to the electrodes. The signals S_{G1}, S_{G2}, and S_{G3} are applied to the entire grating, rather than pixels within the grating. Villeneuve therefore fails to teach the control of individual pixels within a binary super grating, but rather teaches only applying a single voltage to the entire grating to alter its optical properties.

Discussion of the Claims

Turning now to the claims, the differences between the claimed invention and the cited reference will be particularly pointed out.

With respect to claim 1, Villeneuve fails to teach or suggest, in combination with the other limitations of the claim, an optical device including a supergrating comprising "an array of discrete pixels and an array of controllable means each coupled to one of the discrete pixels, the controllable means being responsive to a set of control signals, for altering the modal index of refraction value in corresponding discrete pixels in said array in at least two modes."

With respect to claim 16, Villeneuve fails to teach or suggest, in combination with the other limitations of the claim, a device including a wavelength dependent supergrating coupler comprising "an array of discrete pixels and an array of controllable means each coupled to one of the discrete pixels, the controllable means being responsive to a set of control signals, for altering the modal index of refraction value in corresponding discrete pixels in said array in at least two modes."

With respect to claim 30, Villeneuve fails to teach or suggest in combination with the other limitations of the claim, an optical device including "an array of pixels comprising a supergrating, *each pixel having a modal index of refraction selected from a set of index values*, the array of pixels collectively processing the incident radiation and directing at least one beam of output radiation to at least one output port, *in which at least some of the array of pixels are connected to control means for controllably setting the value of the modal index of refraction of the corresponding pixels in response to a control signal*, so that the process applied to the

incident radiation may be determined by the control signals applied to the control means." (emphasis added)

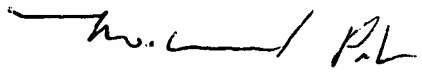
Claims 2-3, 5-8, and 17-19 are dependent on allowable claim 1 and 16, respectively, and are therefore allowable.

Allowable Subject Matter

Claim 4 is objected to but would be allowable if written in independent form including all of the limitation of its base claim and any intervening claims. By this amendment, all of the limitations of claim 1 have been incorporated into claim 4, which is therefore allowable.

All of the claims remaining in the application are now clearly allowable. Favorable consideration and a timely Notice of Allowance are earnestly solicited.

Respectfully submitted,
DORSEY & WHITNEY LLP



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